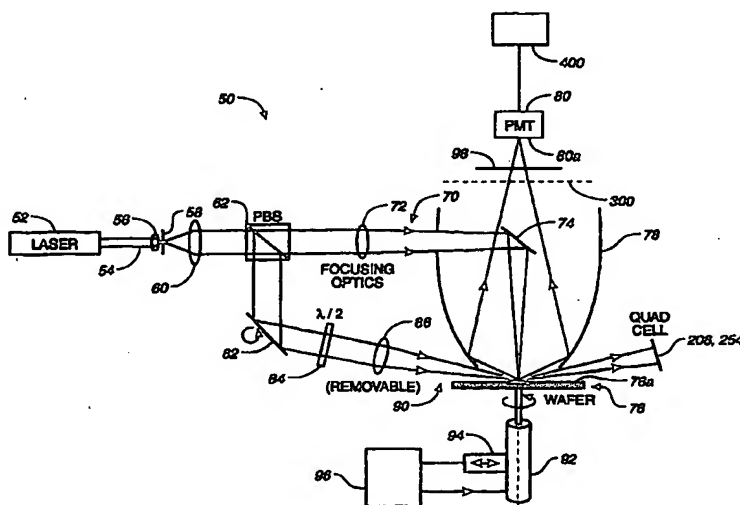




## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>G01N 21/00, 21/86, G01B 11/24</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 99/14575</b> <b>(43) International Publication Date:</b> <b>25 March 1999 (25.03.99)</b>
<b>(21) International Application Number:</b> PCT/US98/19564 <b>(22) International Filing Date:</b> 18 September 1998 (18.09.98) <b>(30) Priority Data:</b> 08/933,771 19 September 1997 (19.09.97) US <b>(71) Applicant (for all designated States except US):</b> KLA-TENCOR CORPORATION [US/US]; 160 Rio Robles, San Jose, CA 95134-1809 (US). <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> VAEZ-IRAVANI, Mehdi [IR/US]; 3430 Mauricia Avenue, Santa Clara, CA 95051 (US). STOKOWSKI, Stanley [US/US]; 755 Contada Circle, Danville, CA 94526 (US). ZHAO, Guoheng [CN/US]; Apartment 2, 435 Acalanes Drive, Sunnyvale, CA 94086 (US). <b>(74) Agents:</b> HSUE, James, S. et al.; Majestic, Parsons, Siebert & Hsue P.C., Suite 1100, Four Embarcadero Center, San Francisco, CA 94111-4106 (US).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: IMPROVED SAMPLE INSPECTION SYSTEM



## (57) Abstract

A curved mirrored surface (78) is used to collect radiation scattered by a sample surface (76a) and originating from a normal illumination beam (70) and an oblique illumination beam (90). The collected radiation is focused to a detector (80). Scattered radiation originating from the normal and oblique illumination beams may be distinguished by employing radiation at two different wavelengths, by intentionally introducing an offset between the spots illuminated by the two beams or by switching the normal and oblique illumination beams (70, 90) on and off alternately. Beam position error caused by change in sample height may be corrected by detecting specular reflection of an oblique illumination beam and changing the direction of illumination in response thereto. Butterfly-shaped spatial filters may be used in conjunction with curved mirror radiation collectors (78) to restrict detection to certain azimuthal angles.